

Electrocatalytic Nitrogen Fixation for the Synthesis of Ammonia at Room Temperature and Pressure

Disclosure Number

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Technology Summary

This invention comprises a method of synthesizing ammonia from nitrogen gas. The new process uses electrochemistry instead of heat and pressure (such as Haber-Bosch) and currently has a Faradaic Efficiency of 9.25% (yield) for single pass, with an energy efficiency of around 8.9% for a single pass at room temperature and pressure (remainder of energy produces H₂ gas). While this sounds low, it is considerably better than anything published to date and we haven't taken advantage of scaling or process optimization. Our process uses water and nitrogen gas and is not greenhouse intensive. The catalyst has only C and N, and no expensive metals. We have attached a draft paper describing the invention. A process operating at room temperature and pressure could be turned on or off at will with little energy penalty, making this invention a good way to utilize excess electricity from intermittent power sources.

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